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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/599,440	06/22/2000	Masato Shimada	Q59177	7701

7590 07/27/2004

Sughrue Mion Zinn MacPeak & Seas PLLC  
2100 Pennsylvania Avenue NW  
Washington, DC 20037-3213

EXAMINER

TUGBANG, ANTHONY D

ART UNIT PAPER NUMBER

3729

DATE MAILED: 07/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/599,440

Applicant(s)

SHIMADA ET AL.

Examiner

A. Dexter Tugbang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 8-12 and 17-51 is/are pending in the application.
- 4a) Of the above claim(s) 24-47 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 8, 17-19 and 48-51 is/are rejected.
- 7) ☒ Claim(s) 20-23 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☒ Certified copies of the priority documents have been received in Application No. 09/107,276.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 11.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election with traverse of Species A, Figures 4E and 7, in the reply filed on 11/21/03 is acknowledged. The traversal is on the ground(s) that the examiner has mischaracterized the various Species. It is noted that Claims 24-39, as well as Claims 40-47, read on the Species B, Figures 18A-18F.

This is not found persuasive because while Species A is directed to forming the oscillating plate on one side of the substrate, Species A is also directed to forming the oscillating plate on the bottom of each channel and forming the piezoelectric thin-film element on the oscillating plate in the channel. This is clearly shown in at least Figure 4E and required by at least Claim 8. Species B is directed to forming a recess and forming pressurization chambers within the recess, as shown in at least Figure 18F. This is required by at least Claims 24 and 32. Also shown in Figure 18F is the formation of a plurality of piezoelectric elements within one, single recess, which is required by at least Claim 40. Therefore, the features mentioned above are not mischaracterized by the examiner in which Claims 8-12 read on Species A, and Claims 24-47 read on Species B. Claims 17-23 are generic to both Species A and B. The requirement is still deemed proper and is therefore made FINAL.

2. Claims 24-47 have been withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected Species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 11/21/03.

***Claim Objections***

3. Claim 8 is objected to because of the following informalities: the term —of— should be inserted after “bottom” (line 4). Appropriate correction is required.

***Response to Arguments***

4. Applicant's arguments, see response, filed 8/5/03, with respect to Claims 8-12 and 17-23 have been fully considered and are persuasive. The previous rejection directed to Lee'861, dated 3/5/03 has been withdrawn. The examiner further notes that Lee et al does not teach forming an oscillating plate film on the bottom of each channel (as required by Claim 8) and does not teach portioning the silicon monocrystalline substrate into unit areas to be used in forming the pressuring chamber substrate (as required by each of Claims 17, 18 and 19).

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless —

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 8, 17, 18, 19, 48 and 49 are rejected under 35 U.S.C. 102(b) as being anticipated by Japanese Patent Publication JP 6-134983, referred to hereinafter as JP'983.

Regarding Claim(s) 8, JP'983 discloses a method of manufacturing an ink-jet printing head comprising: forming a plurality of channels 4 on one side of a silicon monocrystalline substrate 1; forming an oscillating plate film 6 on the bottom of each channel (see either Fig. 1 or

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Fig. 6); forming a piezoelectric thin-film element which comprises a piezoelectric film 9 sandwiched between upper and lower electrodes 9a, 9b on the oscillating plate film; and forming pressure chambers 2 in the opposite side of the silicon monocrystalline substrate so as to be opposite to the channels, respectively.

Regarding Claim(s) 17, 18, 48 and 49, JP'983 alternatively reads as partitioning the monocrystalline substrate into unit areas (regions defined by element 10 in Fig. 3) to eventually be used in forming the pressure chamber substrate; forming a recess (element 3 in Fig. 4) in the side of the pressurization chamber substrate in which the pressuring chambers are to be formed, for each unit area so as to leave a peripheral area along the circumference of the recess; forming the pressurization chambers 2 in the recess; and making a thickness of the peripheral area of the pressuring chamber substrate 1 greater than the height of a slanted side wall for separating the pressurization chambers (see Fig. 1).

Regarding Claim(s) 19, the claimed "recess" can alternatively be read as recess part 4, which is formed in the side of the pressurization chamber substrate opposite of the side on which the pressurization chambers 2 are formed in each unit area. The thickness of a peripheral area along the circumference of the unit area of the pressurizing chamber substrate is increased or greater than the thickness of the pressurizing chamber substrate in the recess.

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 50 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP'983.

With respect to thickness and diameter of the wafer (as recited in each of Claims 50 and 51), each of these is considered to be an effective variable within level of ordinary skill in the art of manufacturing wafers with piezoelectric elements.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of JP'983 by provided a range of between 4 to 8 inches, as well as a wafer thickness of 300 microns, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

#### ***Allowable Subject Matter***

9. Claims 9-12, 22/17, 23/17, 22/18, 23/18, 22/19, 23/19, 23/20/19, 22/20/19, 22/21/19, 23/21/19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

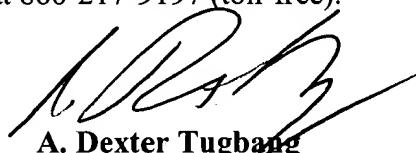
#### ***Conclusion***

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to A. Dexter Tugbang whose telephone number is 703-308-7599. The examiner can normally be reached on Monday - Friday 7:00 am - 3:30 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 703-308-1789. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



**A. Dexter Tugbang**  
**Primary Examiner**  
**Art Unit 3729**

July 26, 2004